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(54) Transmission and/or reception of signals

(57) A signal is transmitted which includes personalized information including data representing information about specific programs targeted for a specific viewer.

A reception apparatus comprises:

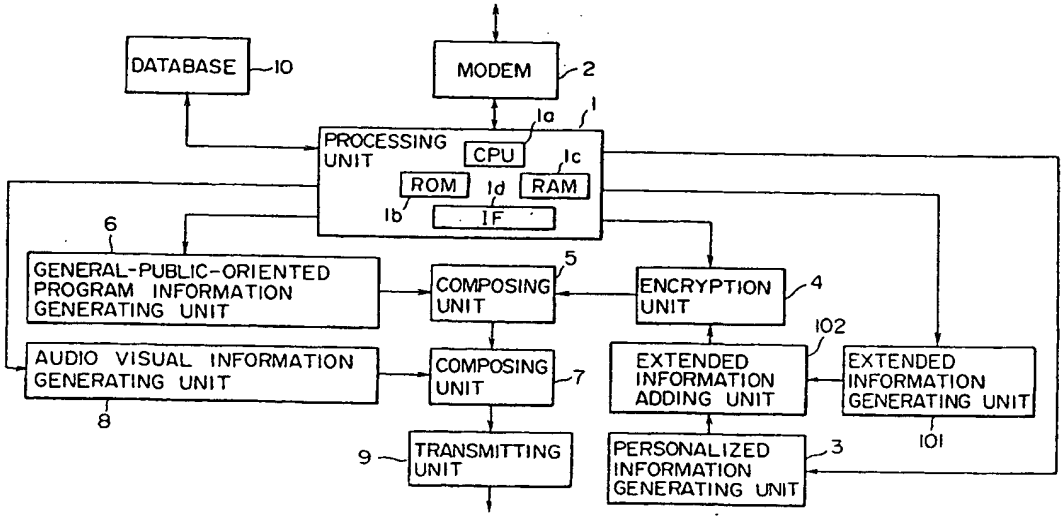
an extraction unit (22, 23, 28) for extracting the data representing the information about the specific programs from the broadcast signal received; and a display unit (26) for displaying the information about the specific programs on the basis of the data representing the information about the specific programs.

A transmission apparatus comprises:

means (10, 1, 2, 3) for generating the personalised information including the program data; and

means (7, 8, 9) for combining the personalized information with a broadcast program signal.

FIG. 1



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Description

The present invention relates to a reception apparatus, a reception method, a transmission apparatus, a transmission method, a transmission-reception apparatus, and a transmission-reception method.

Embodiments of the invention relate to a program selection support apparatus, a program selection support method, a reception apparatus, a reception method, a transmission apparatus, a transmission method, a transmission-reception apparatus, and a transmission-reception method whereby information edited for specific viewers is transmitted, received and reproduced.

Recent advances in information compression technology combined with novel data transmission channels having greater capacities and affording higher transmission speeds have made it possible to transmit an increasingly large number of programs to viewers. With more programs to choose from, the so-called program selection support apparatus is now playing an important role in helping viewers to select desired programs.

The program selection support apparatus illustratively displays the viewing fee of any designated program, the broadcast time of the designated program, type of information to be broadcast (e.g., images, voice, data), a plot of the program, and a list of programs to be broadcast on specific days, so that viewers may select desired programs with ease.

By referencing the past viewing history of each viewer, the program selection support apparatus may retrieve and display personalized information (message) edited by the broadcasting side.

Fig. 15 is a block diagram outlining the constitution of a related art digital television broadcast transmission apparatus. In this block diagram, personalized information is information which is edited by the broadcasting side for specific viewers. For example, personalized information may include key information for allowing a specific viewer to descramble scrambled programs and a message addressed by the broadcasting side to that viewer. General-public-oriented information is information which may be received by all viewers, and illustratively includes EPG (electrical program guide) information for supporting program selection.

In Fig. 15, a processing unit 1 comprises a CPU (central processing unit) 1a, a ROM (read only memory) 1b, a RAM (random access memory) 1c and an interface (IF) 1d. The processing unit 1 controls the apparatus as a whole and performs various computations. A modem 2 receives information through a telephone line from viewers (e.g., information indicating that a specific program has been viewed, information for making a merchandise purchase contract, etc.), demodulates it, and supplies the demodulated information to the processing unit 1.

A personalized information generating unit 3 generates personalized information. An encryption unit 4 encrypts personalized information. A general-public-oriented program information generating unit 6 generates program information destined for the general public. A composing unit 5 composes personalized information from the encryption unit 4 and general-public-oriented program information from the general-public-oriented program information generating unit 6.

An audio visual information generating unit 8 generates information about a plurality of programs composed of images, voice and data (i.e., audio visual information) and, if necessary, scrambles information about specific programs. A composing unit 7 composes information from the audio visual information generating unit 8 and information from the composing unit 5. A transmitting unit 9 transmits information from the composing unit 7 to viewers. A database 10 stores information about subscription contracts with viewers, about their viewing history, and other information.

Personalized information is encrypted by the encryption unit 4 to ensure security. This means that encrypted personalized information is used only by specifically authorized viewers.

Fig. 16 is a block diagram outlining the constitution of a related art program selection support apparatus on the receiving side (i.e., an apparatus for receiving signals sent by the apparatus of Fig. 15) In Fig. 16, a tuner 21 receives information from the broadcasting side and forwards the received information to a separation processing unit 22. The separation processing unit 22 separates the received information into personalized information, general-public-oriented information and audio visual information. A decoder decodes (i.e., deciphers) encrypted personalized information so as to extract a message and key information therefrom.

Fig. 17 is a view of a typical data structure of related art personalized information containing a message and key information. As illustrated, a message 42 and key information 43 are each included independently in personalized information 41.

A display unit 24 is arranged to display the message 42 extracted by the decoder 23. Typically, the display unit 24 may be a CRT (cathode ray tube) display unit or an LCD (liquid crystal display) unit.

An audio visual processing unit 25 selects information about any specific program from the audio visual information separated by the separation processing unit 22, so as to extract audio and visual information included in the program information. When necessary, the audio visual processing unit 25 descrambles the information about a specific program. A display unit 26 displays visual information supplied from the audio visual processing unit 25 or from a processing unit 28. The display unit 26 has the same constitution as the display unit 24 mentioned above. In this respect, the two display units may be replaced by a single unit that performs the functions of both. A speaker unit 27 converts an audio signal from the audio visual processing unit 25 or processing unit 28 into voice.

play unit 26 and audio information to the speaker unit 27. This initiates reproduction of the program.

Where the program is scrambled, the CPU 51 reads key information 43 from the RAM 53 and supplies it to the audio visual processing unit 25. Given the key information 43, the audio visual processing unit 25 descrambles the program in question and feeds descrambled visual and audio information to the display unit 26 and speaker unit 27 respectively for program reproduction.

With the above program selection support device in use, viewers can get EPG's displayed, find desired programs therefrom, and invoke information about any specific program so that the desired program may be selected on the basis of the furnished information.

One disadvantage of the related art program selection support apparatus is that the EPG (electronic program guide) is simply general-public-oriented program information; all viewers are fed with the same EPG. This makes it difficult for individual viewers to select their desired programs quickly and unfailingly.

Embodiments of the present invention described hereinafter with reference to the drawings seek to provide apparatuses and methods whereby each viewer can select swiftly and confidently a specific program from a large number of program offerings.

According to one aspect of the present invention, there is provided a reception apparatus for receiving a broadcast signal which is transmitted from a transmitting side and which includes personalized information comprising data representing information about specific programs targeted for a specific viewer, the reception apparatus comprising: extraction means for extracting the data representing the information about the specific programs from the broadcast signal received; and display means for displaying the information about the specific programs on the basis of the data representing the information about the specific programs.

According to another aspect of the invention, there is provided a transmission apparatus for transmitting personalized information including data representing information about specific programs targeted for a specific viewer, the transmission apparatus comprising: data generation means for generating the data representing the information about the specific programs targeted for the specific viewer; addition means for adding to the personalized information the data representing the information about the specific programs targeted for the specific viewer; signal generation means for generating a broadcast signal by composing a program signal and the personalized information supplemented with the data representing the information about the specific programs targeted for the specific viewer; and transmission means for transmitting the broadcast signal.

According to a further aspect of the invention, there is provided a transmission-reception apparatus having a transmission apparatus and a reception apparatus, the transmission apparatus transmitting a broadcast signal including personalized information comprising data representing information about specific programs targeted for a specific viewer, the reception apparatus receiving the broadcast signal; wherein the transmission apparatus comprises: data generation means for generating the data representing the information about the specific programs targeted for the specific viewer; addition means for adding to the personalized information the data representing the information about the specific programs targeted for the specific viewer; signal generation means for generating a broadcast signal by composing a program signal and the personalized information supplemented with the data representing the information about the specific programs targeted for the specific viewer; and transmission means for transmitting the broadcast signal; and wherein the reception apparatus comprises: extraction means for extracting the data representing the information about the specific programs from the broadcast signal received; and display means for displaying the information about the specific programs on the basis of the data representing the information about the specific programs.

According to an even further aspect of the invention, there is provided a reception method for receiving a broadcast signal which is transmitted from a transmitting side and which includes personalized information comprising data representing information about specific programs targeted for a specific viewer, the reception method comprising the steps of: extracting the data representing the information about the specific programs from the broadcast signal received; and displaying the information about the specific programs on the basis of the data representing the information about the specific programs.

According to a still further aspect of the invention, there is provided a transmission method for transmitting personalized information including data representing information about specific programs targeted for a specific viewer, the transmission method comprising the steps of: generating the data representing the information about the specific programs targeted for the specific viewer; adding to the personalized information the data representing the information about the specific programs targeted for the specific viewer; generating a broadcast signal by composing a program signal and the personalized information supplemented with the data representing the information about the specific programs targeted for the specific viewer; and transmitting the broadcast signal.

According to a yet further aspect of the invention, there is provided a transmission-reception method both for transmitting a broadcast signal including personalized information comprising data representing information about specific programs targeted for a specific viewer, and for receiving the broadcast signal, the transmission-reception method comprising the steps of: generating the data representing the information about the specific programs targeted for the specific viewer; adding to the personalized information the data represent-

unit 102, the extended information 44 generated by the extended information generating unit 101 is added to the personalized information generated by the personalized information generating unit 3. The personalized information supplemented with the extended information 44 is fed to the encryption unit 4. The other workings are the same as those of the comparable blocks in Fig. 15.

Fig. 5 is a flowchart of steps in which the apparatus of Fig. 2 extracts extended information 44 from the information it has received. In response to a command from the input unit 31, the tuner 21 (reception means) receives a signal on a specific broadcast band, demodulates the signal, and outputs the demodulated result to the separation processing unit 22. Given the information from the tuner 21, the separation processing unit 22 (first extraction means) separates personalized information 41 (step S11) therefrom and feeds the separated information to the decoder 23. The decoder 23 decodes the encrypted personalized information 41 to extract the message 42 and key information 43 (step S12). The message 42 is sent to the extended information extracting unit 201 and the key information 43 to the processing unit 28. The extended information extracting unit 201 extracts the extended information 44 from the message 42 (step S13) and feeds the extracted information to the processing unit 28. After extraction of the extended information 44, the message 42 is supplied to the display unit 24 for display in the form of a personalized message to the viewer in question.

Fig. 6 is a flowchart of steps in which the CPU 51 of the processing unit 28 performs processing (called here the main processing) on control data 62 included in the extended information 44 extracted by the extended information extracting unit 201.

In the main processing, the CPU 51 of the processing unit 28 checks to see if an input is made through the input unit 31 to request execution of the extended information 44 sent from the broadcasting side (step S31). If no such input is judged to be made ("NO" in step S31), the processing comes to an end ("END" in Fig. 6). If the input is judged to be made ("YES" in step S31), the CPU 51 extracts display data 61 and control data 62 from the extended information 44 fed from the extended information extracting unit 201 (step S32). The two kinds of data are stored separately into the RAM 53 (step S33). The CPU 51 thereafter reads the control data 62 successively from the RAM 53, and carries out the processing described by the control data (program) 62 (step S34). When the processing of the control data 62 is completed, the main processing is brought to an end ("END" in Fig. 6).

The reception of the extended information 44 is indicated to the viewer illustratively by having an appropriate indication (e.g., "MESSAGE RECEIVED") shown on the display unit 26. With this embodiment, when the viewer makes the necessary input through the input unit 31, the display data 61 and control data 62 are extracted from the extended information 44, separated from one another and stored independent of one another into the RAM 53. Alternatively, these steps may be carried out automatically upon receipt of the extended information 44.

What is performed in step S34 of the main processing in Fig. 6 will now be described by citing specific examples. The proceedings carried out by use of extended information 44, i.e., the processes executed in step S34 of Fig. 6 are illustratively as follows:

(A) Presenting each viewer with a list of programs (e.g., recommended program list) edited by the broadcasting side and specifically for that viewer in order to display information about any program designated by the viewer in the list

(B) Presenting each viewer with a program selection list edited by the broadcasting side specifically for that viewer so as to receive any program designated by the viewer in the list

(C) Presenting each viewer with a merchandise list edited by the broadcasting side specifically for that viewer in order to conclude a purchase contract on any item designated by the viewer in the list

The processes (A) through (C) above will now be described more specifically by having recourse to the accompanying flowcharts.

Fig. 7 is a flowchart of steps in which the process (A) above is carried out. In this process, the display unit 26 first displays a program list which is edited by the broadcasting side specifically for each viewer and attached to the display data 61 for transmission to that viewer. When the viewer designates a desired program in the program list, the program information database 202 is searched for the information about the designated program and the retrieved information is displayed.

In the flowchart of Fig. 7, the CPU 51 of the processing unit 28 reads the display data 61 placed in the RAM 53 as a result of the execution of step S33 in the main processing (step S51). On the basis of the procedure described in the control data 62 also stored in the RAM 53, the CPU 51 displays the program list (i.e., recommended program list) onto the display unit 26 (step S52).

Fig. 8 shows a typical program list displayed on the display unit 26 as a result of the execution of step S52. In this example, four programs ("○○○○" (movie), "△△△△" (simulation game), "XXXX" (live performance) and "□□□□" (share price quotations)) are indicated as candidate programs making up the program list.

The program list is prepared by the broadcasting side specifically for each viewer based on the reception history of individual viewers, viewer-designated preferred genres and other data. Programs in which the viewer in question has little interest are not included in the list. Only the information significant to each viewer is offered.

The CPU 51 checks to see if an input is made

mation. Fig. 14 is a flowchart of steps in which the alternative scheme above is practiced. As with the other processes, this processing is carried out as part of the main processing of Fig. 6.

In the flowchart of Fig. 14, the CPU 51 of the processing unit 28 on the receiving side first reads display data 61 placed in the RAM 53 as the result of the execution of step S33 in the main processing (step S111). On the basis of the procedure described in the control data 62 also stored in the RAM 53, the CPU 51 displays a program list on the display unit 26 (step S112).

The CPU 51 then checks to see if an input is made through the input unit 31 to designate a specific program among the candidate programs making up the program list (step S113). If no such input is judged to be made ("NO" in step S113), the check is repeated until an input is made. If an input is judged to be made ("YES" in step S113), the CPU 51 supplies a suitable processing command to the modem 32. The modem 32 sends a request over telephone lines to the broadcasting side asking the latter to transmit information about the designated program (step S114).

Following the request, the modem 2 on the broadcasting side in Fig. 1 receives the information transmitted by the viewer and forwards it to the processing unit 1. The CPU 1a of the processing unit 1 searches the database 10 for the requested information about the specific program. With the program information retrieved, the CPU 1a feeds the acquired information to the extended information generating unit 101 so that the latter will generate extended information 44 for displaying the appropriate program information on the viewer's display unit 26. The extended information 44 is added by the extended information adding unit 102 to the personalized information 41 before being encrypted by the encryption unit 4. The transmitting unit 9 (transmission means) transmits the encrypted information through the composing units 5 and 7 to the viewer who made the request.

The receiving side performs the processing of Fig. 5 on the information sent from the broadcasting side, so as to extract the extended information 44. The CPU 51 of the processing unit 28 obtains the extended information 44 (step S115) and extracts the display data 61 from the extended information 44 thus acquired. Thereafter, the CPU 51 feeds the display data 61 to the display unit 26 for display thereon (step S116). The CPU 51 then returns to step S34 of the main processing ("RETURN" in Fig. 14).

The processing above makes it possible to display additionally program information and merchandise information not stored in the program information database 202.

In any of the above examples, a program has been shown to be added to the control data 62 so that the process in question is carried out on the basis of that program. Alternatively, a plurality of programs may be stored in advance in, say, the ROM 52. In this case, the control data 62 may be supplemented by data for selecting any one of the plurality of programs, the added data allowing any of the programs held in the ROM 52 to be carried out to implement the corresponding process. This scheme reduces the amount of information to be transmitted from the broadcasting side. In this specification, control data refers either to the program itself or to data for designating the predetermined program prepared on the receiving side.

As described and according to the reception apparatus and method of the invention, a broadcast signal is received which is transmitted from a transmitting side and which includes personalized information comprising data representing information about specific programs targeted for a specific viewer. The data representing the information about the specific programs is extracted from the broadcast signal received. The information about the specific programs is then displayed on the basis of the data representing the information about the specific programs. The information about the specific programs may include a list of the specific programs which may be displayed. The personalized information may include control data used to search for program information. Program information desired by a user may be searched for through the information about the specific programs by use of the control data. The personalized information may include control data for program selection. A program desired by a user may be selected from the list of the specific programs by use of the control data. The personalized information may include a list of specific items of merchandise which may be displayed. The personalized information may include control data for merchandise item selection. An item of merchandise desired by a user may be selected from the list of the specific items of merchandise by use of the control data. The personalized information may be encrypted when transmitted and decoded when received. The schemes allow each viewer to select in secrecy any desired program or item of merchandise quickly and unfailingly on the basis of the information sent from the transmitting side.

According to the transmission apparatus and method of the invention, personalized information is transmitted which includes data representing information about specific programs targeted for a specific viewer. The data representing the information about the specific programs targeted for the specific viewer is first generated. The personalized information is supplemented with the data representing the information about the specific programs targeted for the specific viewer. A broadcast signal is generated by composing a program signal and the personalized information supplemented with the data representing the information about the specific programs targeted for the specific viewer. The broadcast signal thus generated is then transmitted. The personalized information may be encrypted when transmitted and decoded when received. This allows each viewer

9. A transmission apparatus according to claim 8, further comprising encryption means for encrypting said personalized information.

10. A transmission-reception apparatus having a transmission apparatus and a reception apparatus, said transmission apparatus transmitting a broadcast signal including personalized information comprising data representing information about specific programs targeted for a specific viewer, said reception apparatus receiving said broadcast signal;

wherein said transmission apparatus comprises:
data generation means for generating said data representing said information about said specific programs targeted for said specific viewer;
addition means for adding to said personalized information said data representing said information about said specific programs targeted for said specific viewer;
signal generation means for generating a broadcast signal by composing a program signal and said personalized information supplemented with said data representing said information about said specific programs targeted for said specific viewer; and
transmission means for transmitting said broadcast signal; and
wherein said reception apparatus comprises:
extraction means for extracting said data representing said information about said specific programs from said broadcast signal received; and
display means for displaying said information about said specific programs on the basis of said data representing said information about said specific programs.

11. A transmission-reception apparatus according to claim 10, wherein said transmission apparatus further comprises encryption means for encrypting said personalized information, and wherein said reception means further comprises decoding means for decoding said personalized information encrypted.

12. A reception method for receiving a broadcast signal which is transmitted from a transmitting side and which includes personalized information comprising data representing information about specific programs targeted for a specific viewer, said reception method comprising the steps of:

extracting said data representing said information about said specific programs from said broadcast signal received; and
displaying said information about said specific programs on the basis of said data representing said information about said specific programs.

13. A reception method according to claim 12, wherein said personalized information is encrypted, said reception method further comprising the step of decoding said personalized information encrypted.

14. A transmission method for transmitting personalized information including data representing information about specific programs targeted for a specific viewer, said transmission method comprising the steps of:

generating said data representing said information about said specific programs targeted for said specific viewer;
adding to said personalized information said data representing said information about said specific programs targeted for said specific viewer;
generating a broadcast signal by composing a program signal and said personalized information supplemented with said data representing said information about said specific programs targeted for said specific viewer; and
transmitting said broadcast signal.

15. A transmission method according to claim 14, further comprising the step of encrypting said personalized information.

16. A transmission-reception method both for transmitting a broadcast signal including personalized information comprising data representing information about specific programs targeted for a specific viewer, and for receiving said broadcast signal, said transmission-reception method comprising the steps of:

generating said data representing said information about said specific programs targeted for said specific viewer;
adding to said personalized information said data representing said information about said specific programs targeted for said specific viewer;
generating a broadcast signal by composing a program signal and said personalized information supplemented with said data representing said information about said specific programs targeted for said specific viewer;
transmitting said broadcast signal;
receiving said broadcast signal;
extracting said data representing said information about said specific programs from said broadcast signal received; and
displaying said information about said specific

FIG. 1

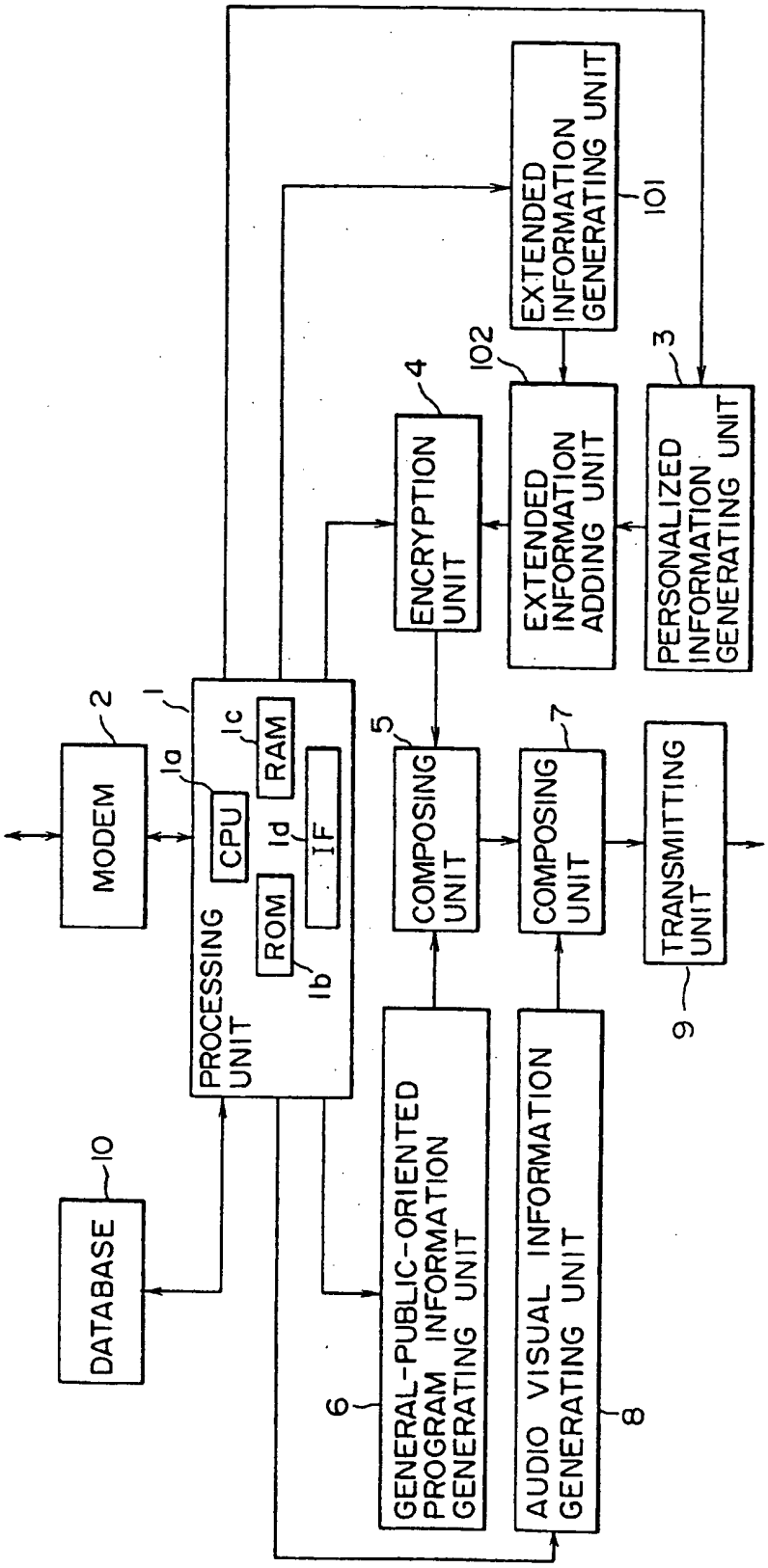

MODEM
2
1
1a
CPU
1c
RAM
1d
IF
ROM
1b
PROCESSING UNIT
DATABASE
10
ENCRYPTION UNIT
4
EXTENDED INFORMATION GENERATING UNIT
101
102
EXTENDED INFORMATION ADDING UNIT
PERSONALIZED INFORMATION GENERATING UNIT
3
5
COMPOSING UNIT
7
COMPOSING UNIT
TRANSMITTING UNIT
9
6
GENERAL-PUBLIC-ORIENTED PROGRAM INFORMATION GENERATING UNIT
8
AUDIO VISUAL INFORMATION GENERATING UNIT

FIG. 3

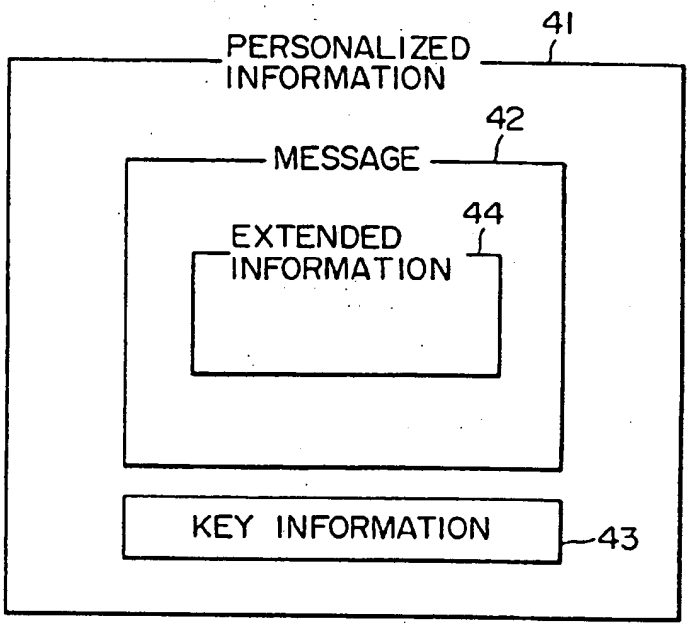

41
PERSONALIZED INFORMATION
42
MESSAGE
44
EXTENDED INFORMATION
KEY INFORMATION
43

FIG. 4

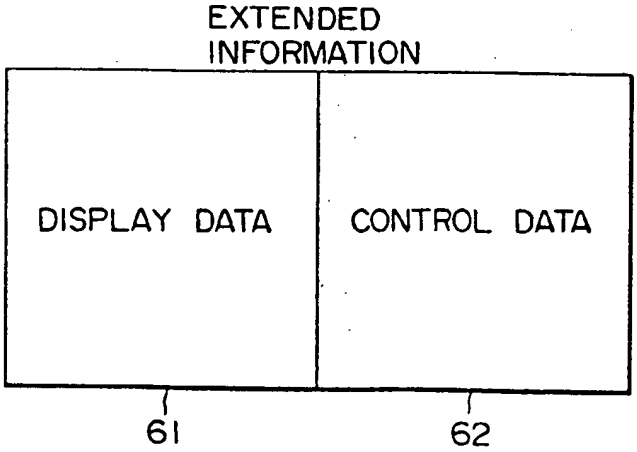

EXTENDED INFORMATION
DISPLAY DATA
CONTROL DATA
61
62

FIG. 7

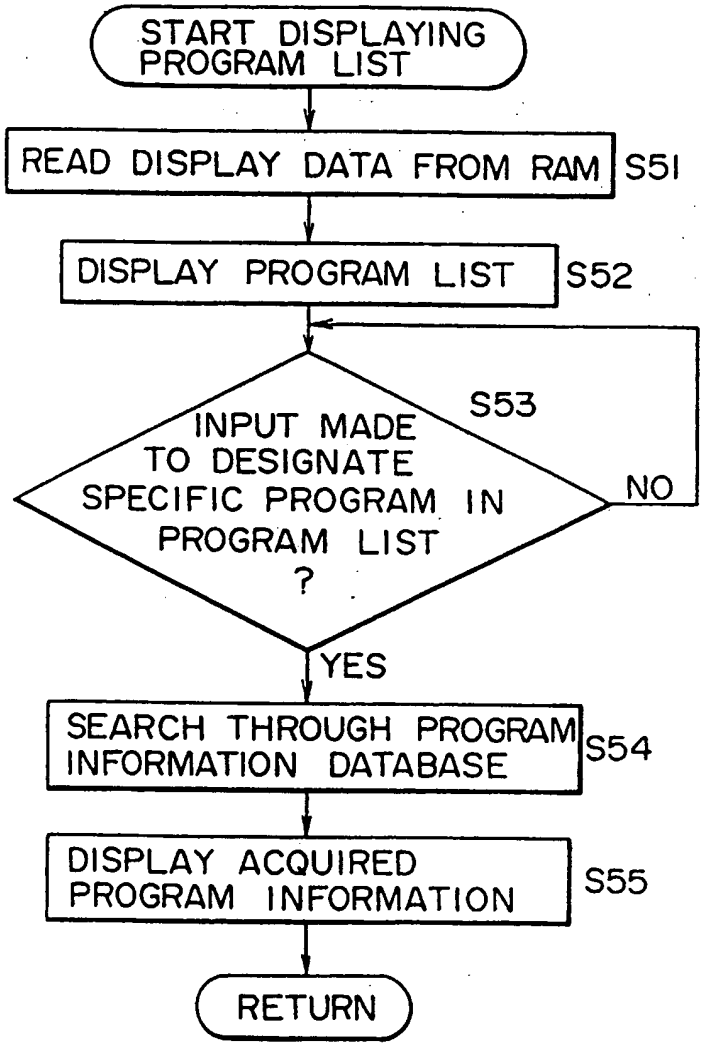

START DISPLAYING PROGRAM LIST
READ DISPLAY DATA FROM RAM
S51
DISPLAY PROGRAM LIST
S52
S53
INPUT MADE TO DESIGNATE SPECIFIC PROGRAM IN PROGRAM LIST ?
NO
YES
SEARCH THROUGH PROGRAM INFORMATION DATABASE
S54
DISPLAY ACQUIRED PROGRAM INFORMATION
S55
RETURN

FIG. 10

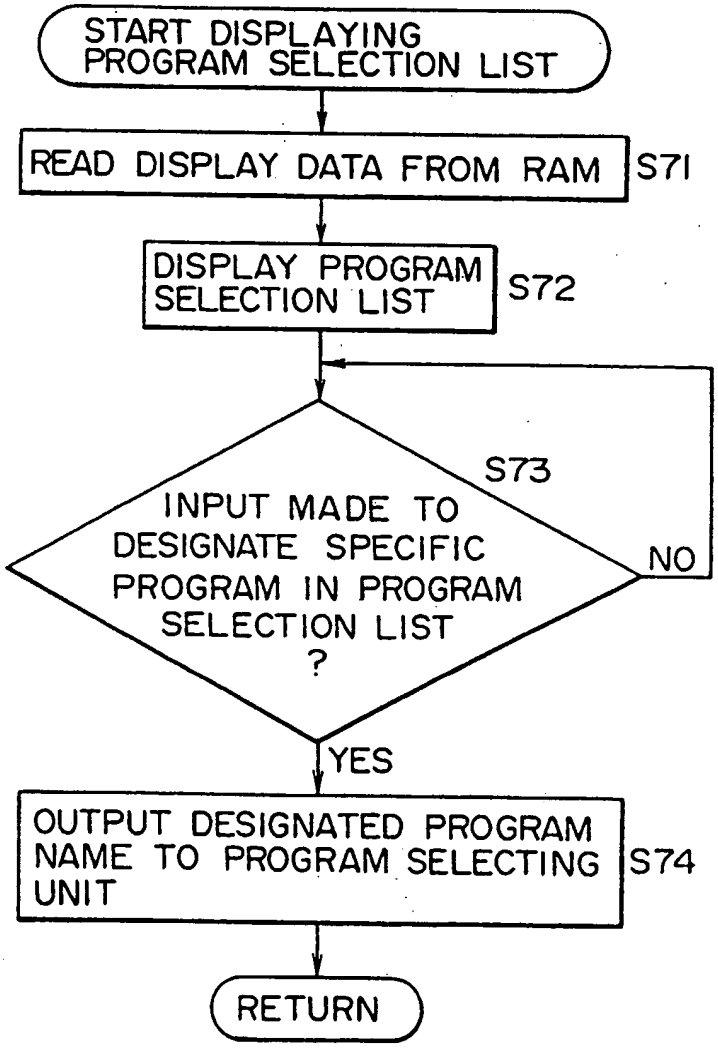

START DISPLAYING PROGRAM SELECTION LIST
READ DISPLAY DATA FROM RAM
S71
DISPLAY PROGRAM SELECTION LIST
S72
S73
INPUT MADE TO DESIGNATE SPECIFIC PROGRAM IN PROGRAM SELECTION LIST ?
NO
YES
OUTPUT DESIGNATED PROGRAM NAME TO PROGRAM SELECTING UNIT
S74
RETURN

FIG. 12


MERCHANDISE LIST
1 NECKLACE ¥○○
2 BRACELET ¥××
3 PENDANT ¥△△
4 RING ¥□□
5 EARRINGS ¥☆☆
PLEASE MAKE A SELECTION

FIG. 13

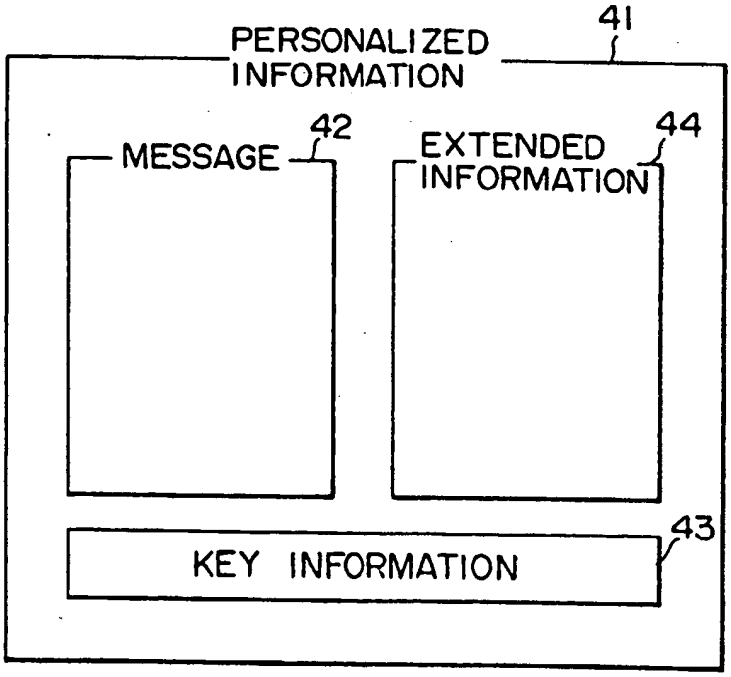

PERSONALIZED INFORMATION
41
MESSAGE
42
EXTENDED INFORMATION
44
KEY INFORMATION
43

FIG. 15

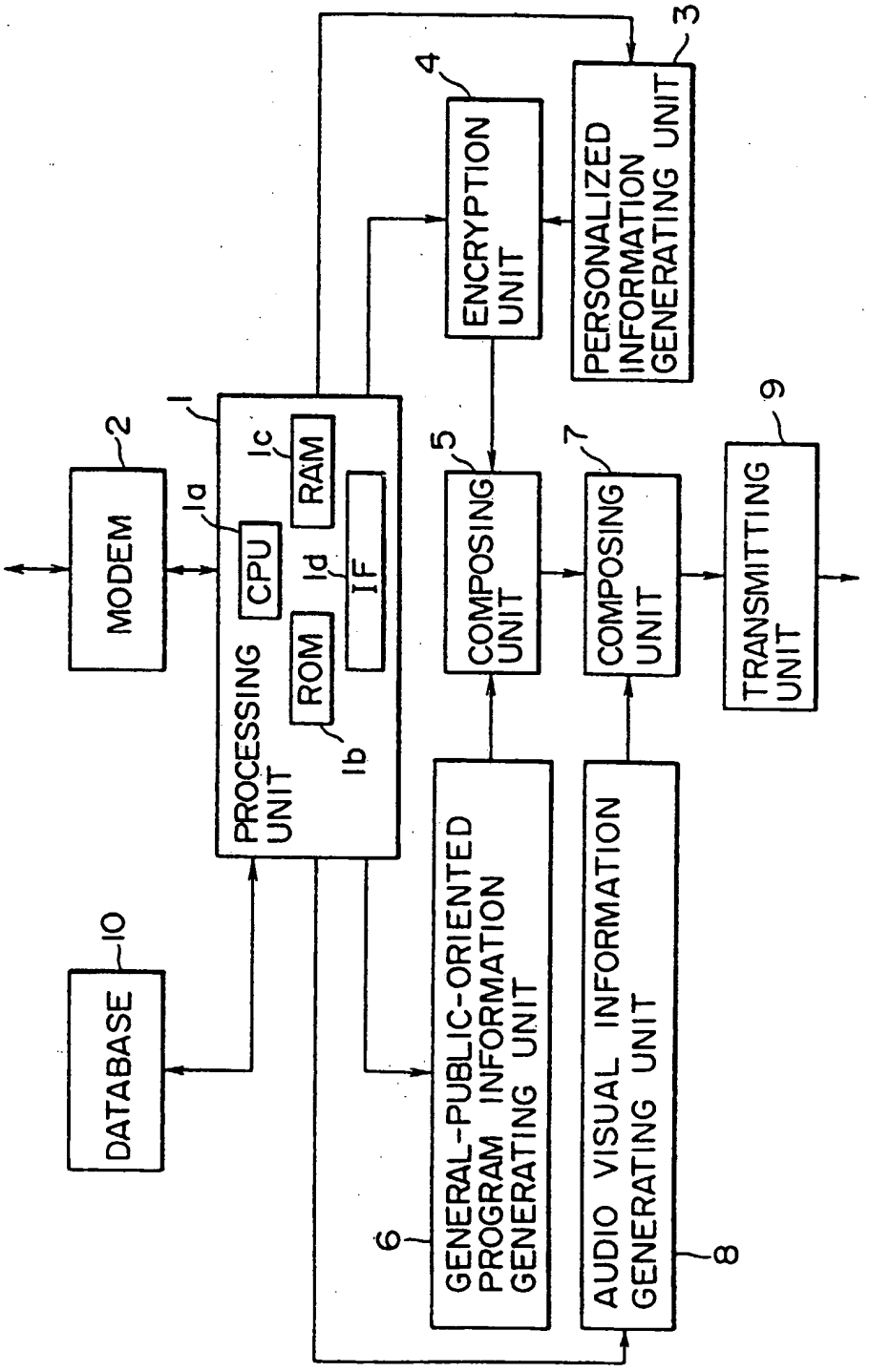

PROCESSING UNIT
CPU
RAM
ROM
IF
1
1a
1b
1c
1d
MODEM
2
PERSONALIZED INFORMATION GENERATING UNIT
3
ENCRYPTION UNIT
4
COMPOSING UNIT
5
GENERAL-PUBLIC-ORIENTED PROGRAM INFORMATION GENERATING UNIT
6
COMPOSING UNIT
7
AUDIO VISUAL INFORMATION GENERATING UNIT
8
TRANSMITTING UNIT
9
DATABASE
10

FIG. 17

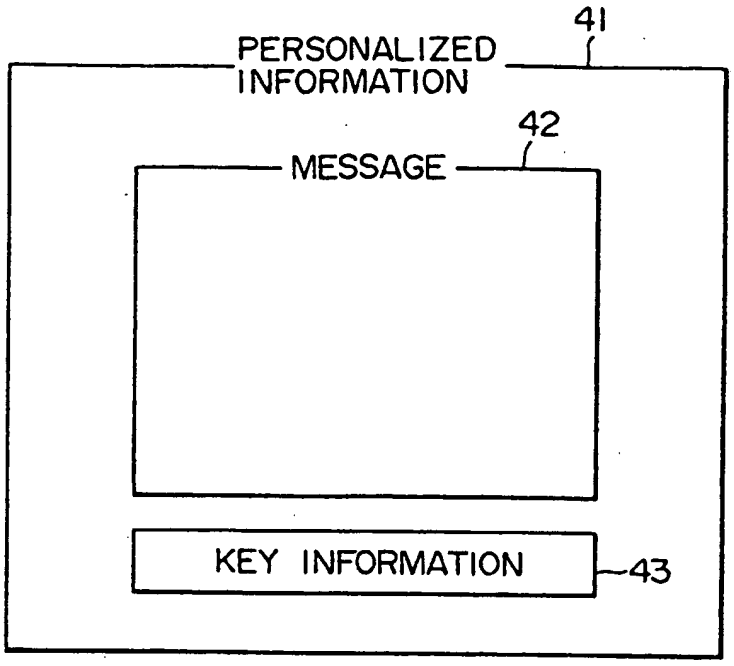
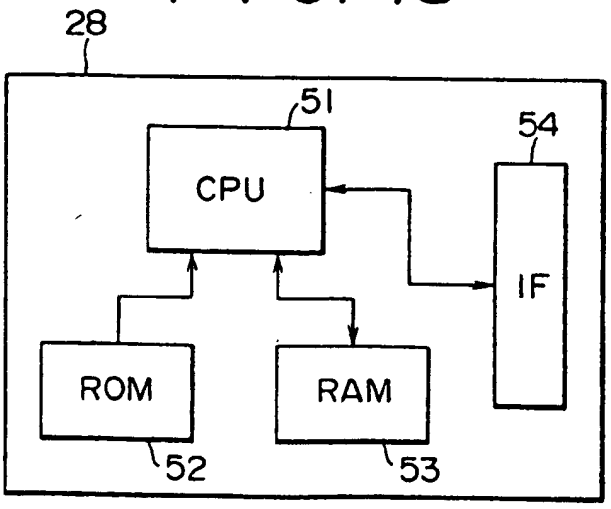

41
PERSONALIZED INFORMATION
42
MESSAGE
KEY INFORMATION
43

FIG. 18


28
51
CPU
54
IF
ROM
RAM
52
53